FIG.1 (PRIOR ART)

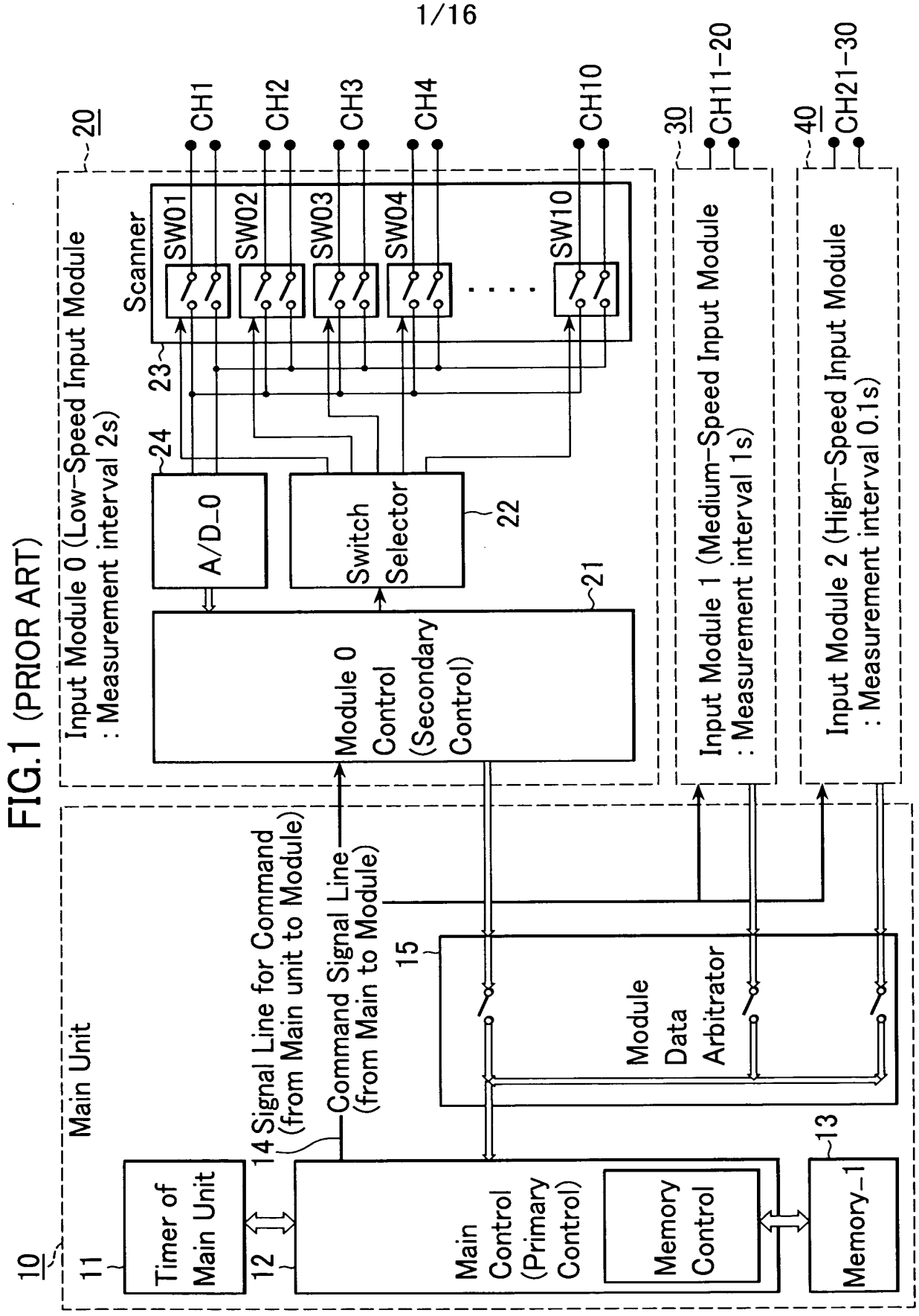


FIG.2 (PRIOR ART)

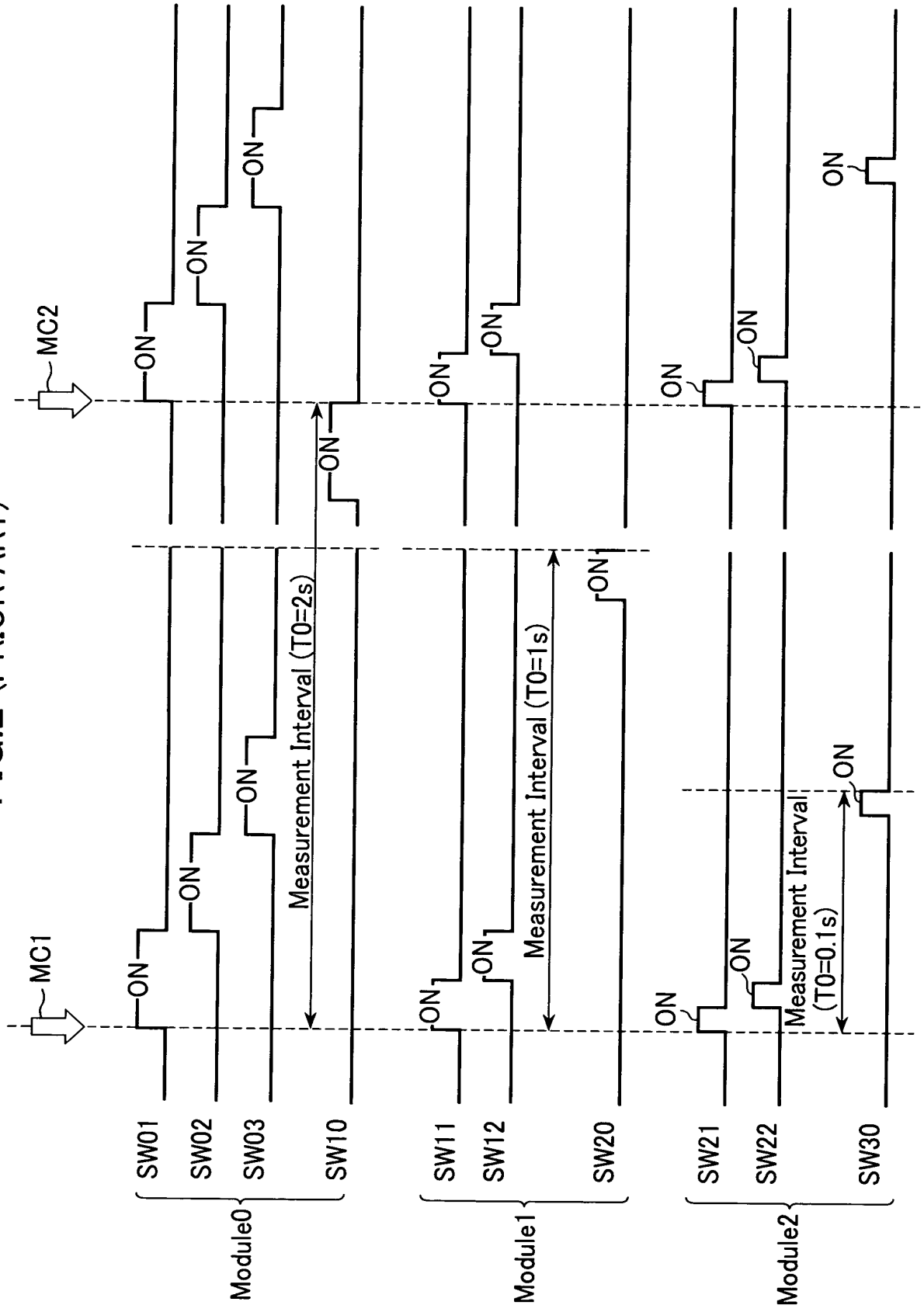


FIG.3

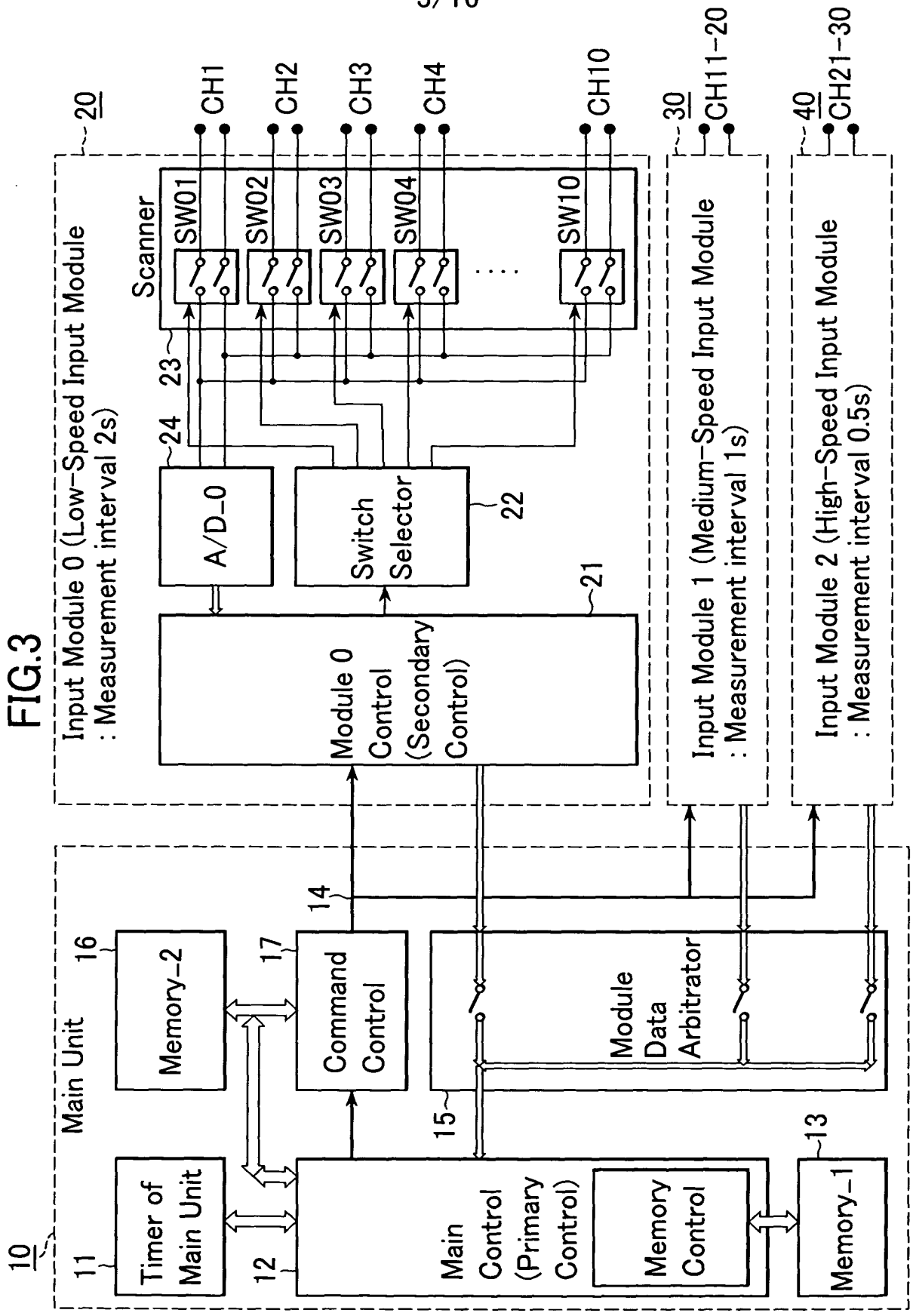

10
Main Unit
11
Timer of Main Unit
12
Main Control (Primary Control)
13
Memory-1
Memory Control
14
15
16
Memory-2
17
Command Control
Module Data Arbitrator
20
Input Module 0 (Low-Speed Input Module : Measurement interval 2s)
Scanner
SW01
SW02
SW03
SW04
SW10
CH1
CH2
CH3
CH4
CH10
23
24
A/D_0
Switch Selector
22
21
Module 0 Control (Secondary Control)
30
Input Module 1 (Medium-Speed Input Module : Measurement interval 1s)
CH11-20
40
Input Module 2 (High-Speed Input Module : Measurement interval 0.5s)
CH21-30

FIG.4

Measurement / Input Module	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

1 : A command is sent
0 : A command is not sent

FIG.5

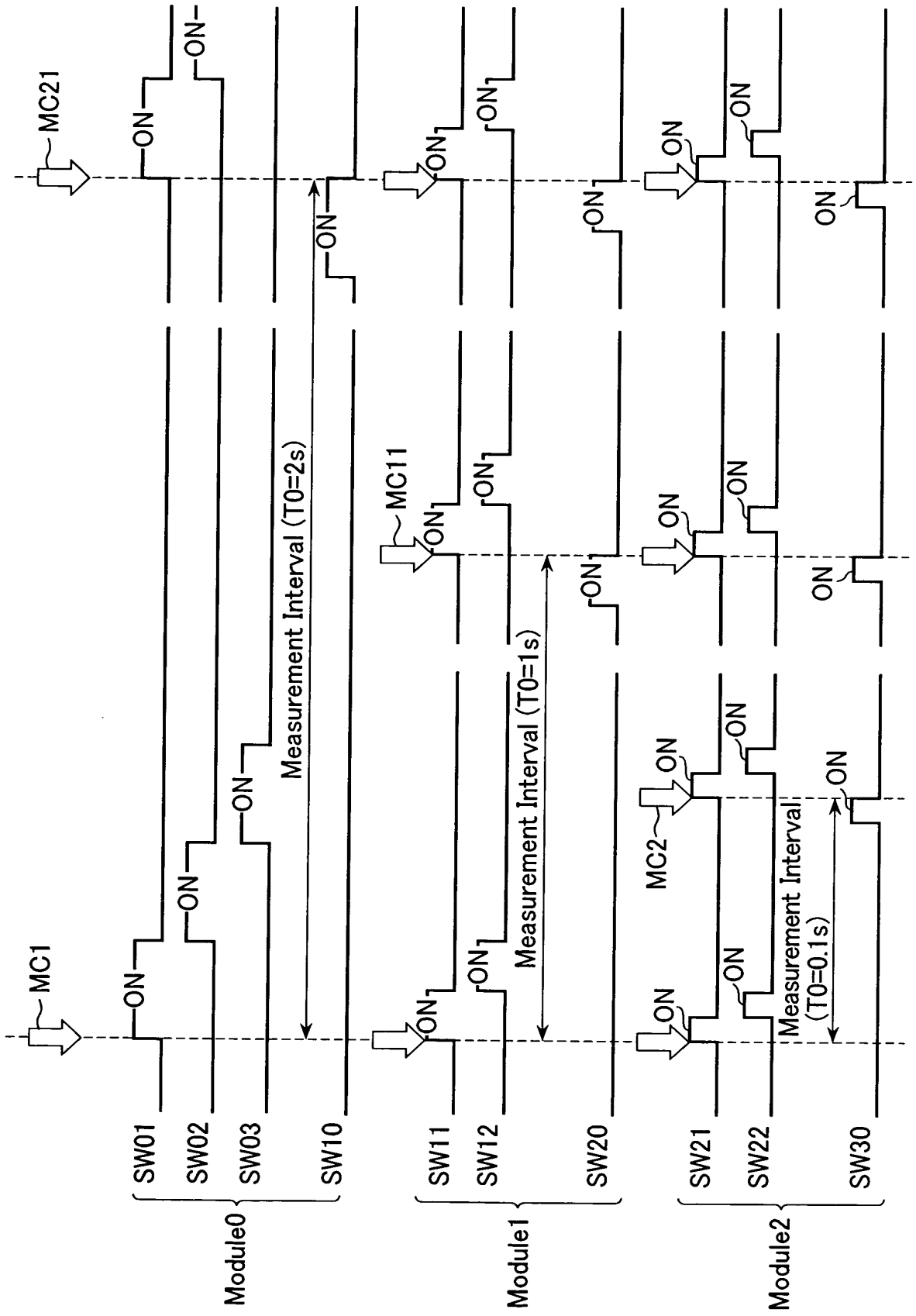

MC1
MC21
MC11
MC2
ON
Measurement Interval (T0=2s)
Measurement Interval (T0=1s)
Measurement Interval (T0=0.1s)
SW01
SW02
SW03
SW10
SW11
SW12
SW20
SW21
SW22
SW30
Module0
Module1
Module2

FIG.6

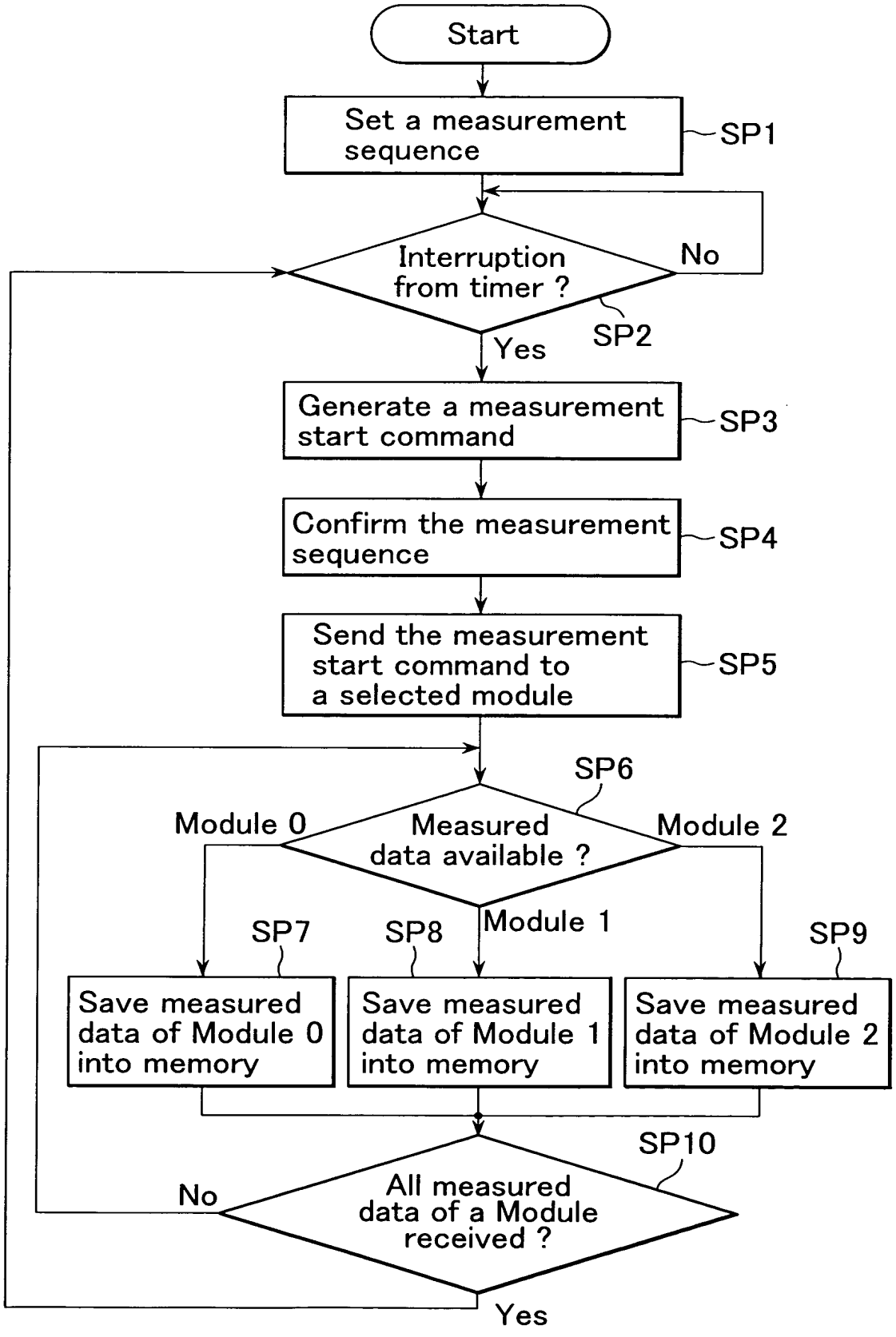

Start
Set a measurement sequence
SP1
Interruption from timer ?
No
SP2
Yes
Generate a measurement start command
SP3
Confirm the measurement sequence
SP4
Send the measurement start command to a selected module
SP5
SP6
Module 0
Measured data available ?
Module 2
Module 1
SP7
SP8
SP9
Save measured data of Module 0 into memory
Save measured data of Module 1 into memory
Save measured data of Module 2 into memory
SP10
No
All measured data of a Module received ?
Yes

FIG.7

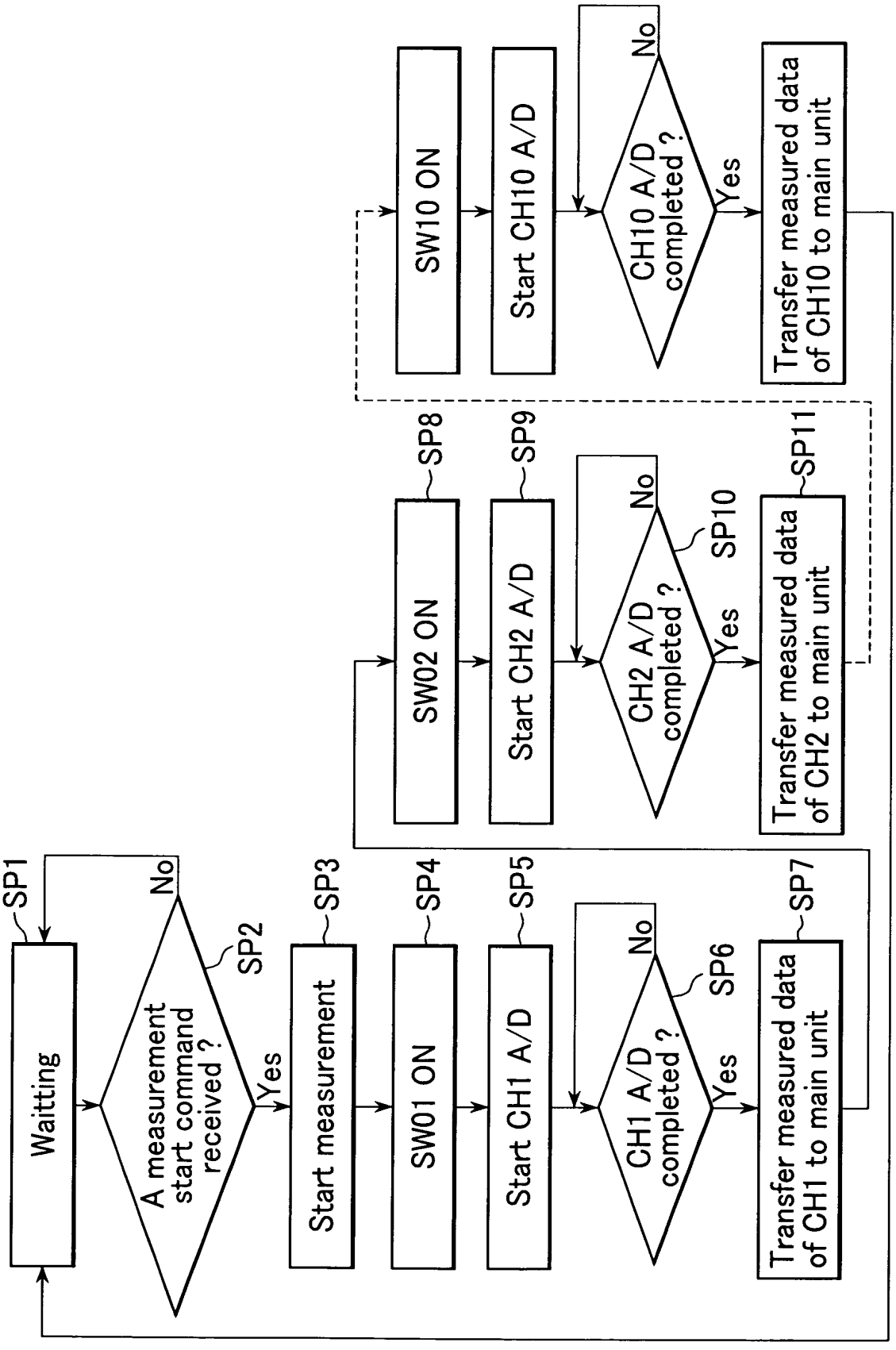

SP1
Waitting
SP2
A measurement start command received ?
No
Yes
SP3
Start measurement
SP4
SW01 ON
SP5
Start CH1 A/D
SP6
CH1 A/D completed ?
No
Yes
SP7
Transfer measured data of CH1 to main unit
SP8
SW02 ON
SP9
Start CH2 A/D
SP10
CH2 A/D completed ?
No
Yes
SP11
Transfer measured data of CH2 to main unit
SW10 ON
Start CH10 A/D
CH10 A/D completed ?
No
Yes
Transfer measured data of CH10 to main unit

FIG.8

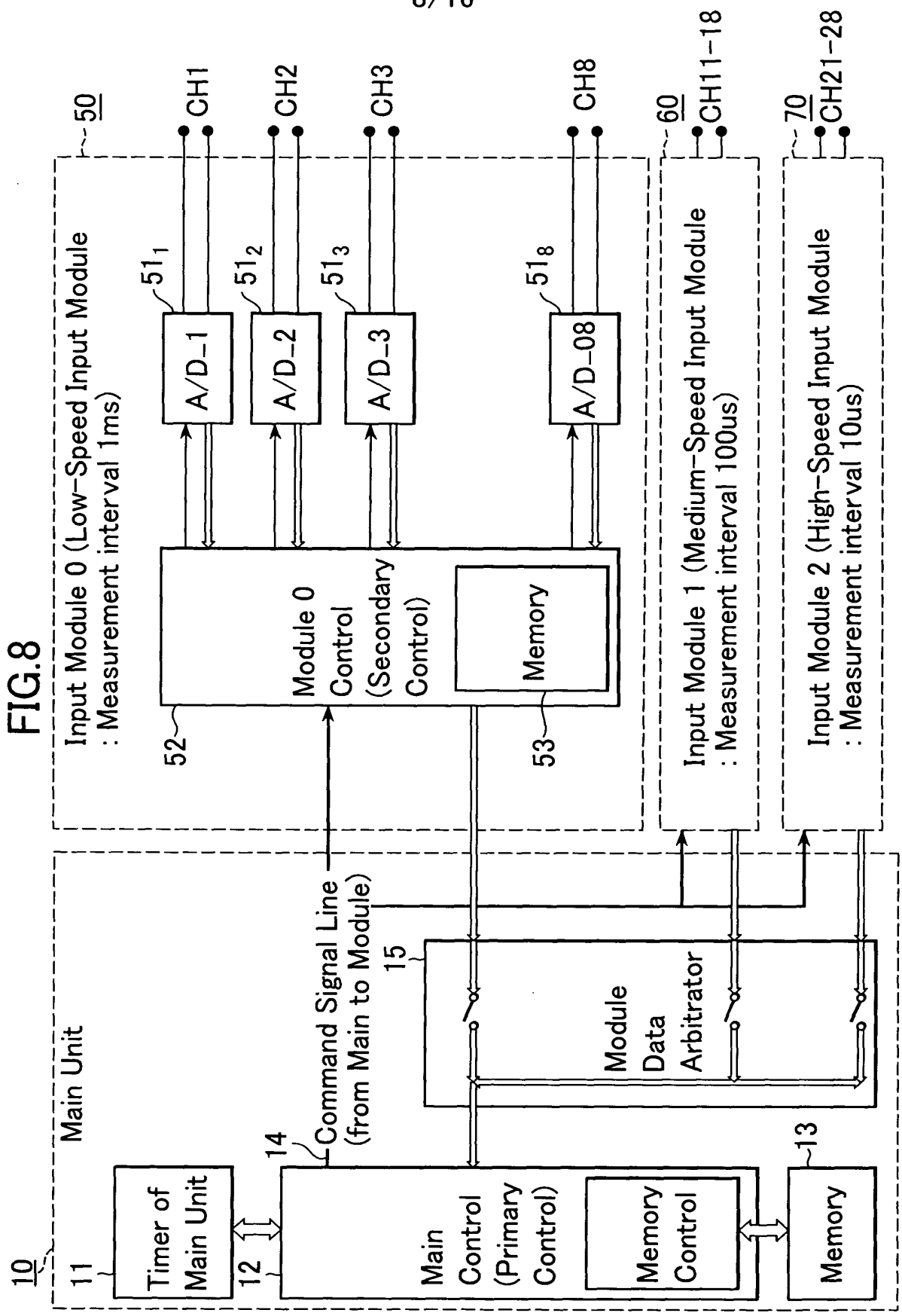

10
Main Unit
11
Timer of Main Unit
12
Main Control (Primary Control)
13
Memory
Memory Control
14
Command Signal Line (from Main to Module)
15
Module Data Arbitrator
50
Input Module 0 (Low-Speed Input Module : Measurement interval 1ms)
CH1
CH2
CH3
CH8
51 1
51 2
51 3
51 8
A/D_1
A/D_2
A/D_3
A/D_08
52
Module 0 Control (Secondary Control)
53
Memory
60
CH11-18
Input Module 1 (Medium-Speed Input Module : Measurement interval 100us)
70
CH21-28
Input Module 2 (High-Speed Input Module : Measurement interval 10us)

FIG.9

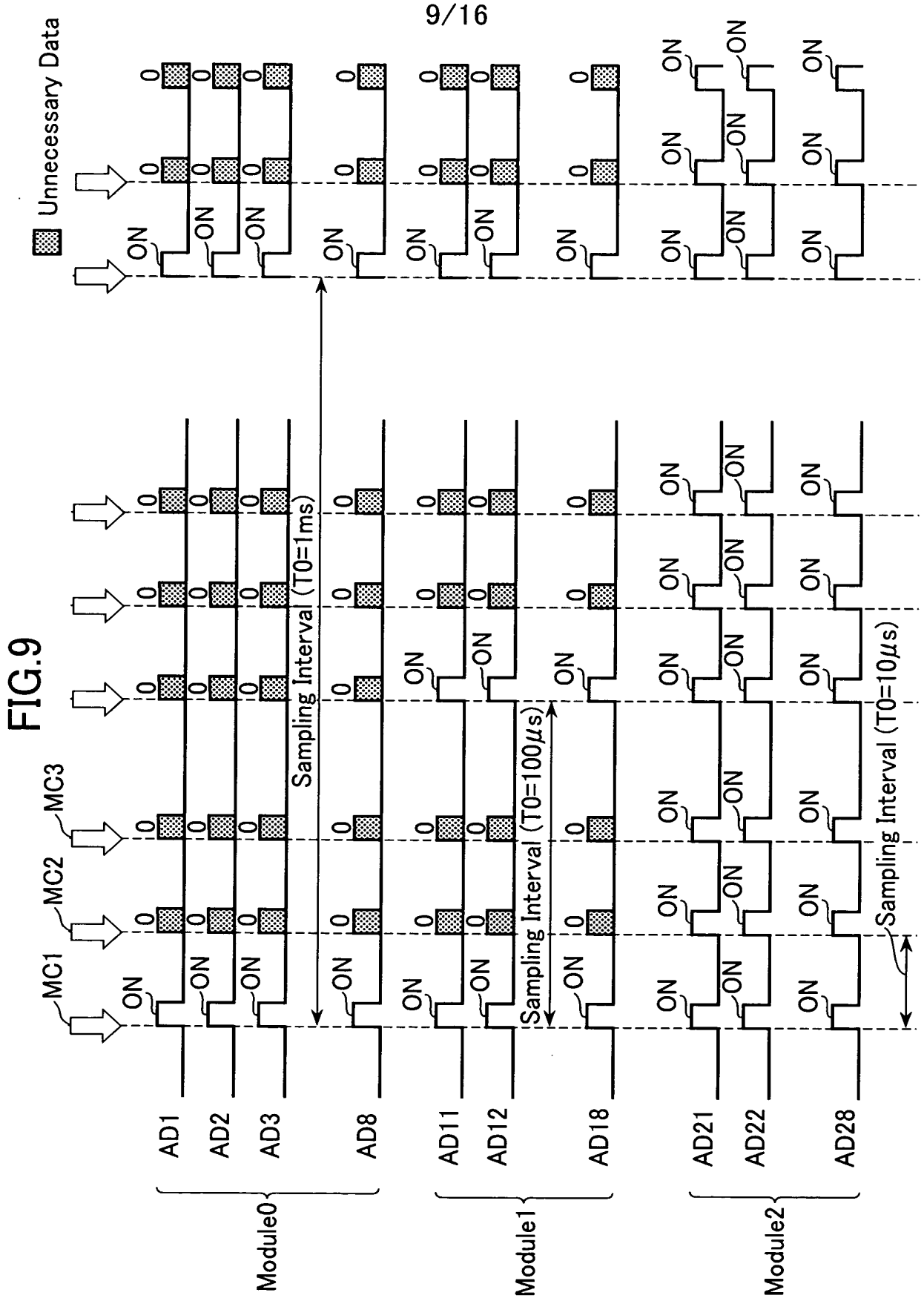

Unnecessary Data
MC1
MC2
MC3
ON
0
Sampling Interval (T0=1ms)
Sampling Interval (T0=100μs)
Sampling Interval (T0=10μs)
AD1
AD2
AD3
AD8
AD11
AD12
AD18
AD21
AD22
AD28
Module0
Module1
Module2

FIG.10

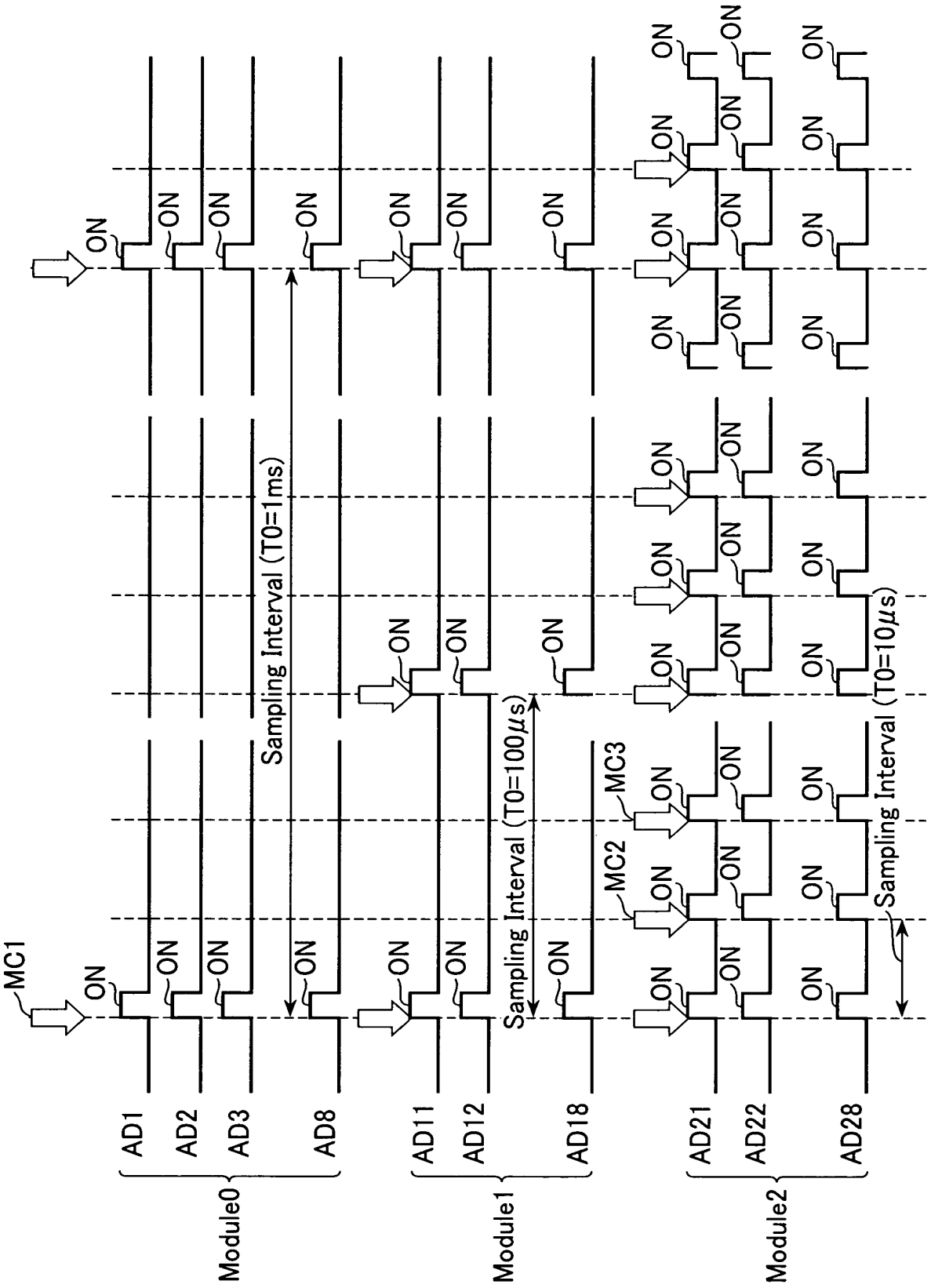

MC1
MC2
MC3
ON
Sampling Interval (T0=1ms)
Sampling Interval (T0=100μs)
Sampling Interval (T0=10μs)
AD1
AD2
AD3
AD8
AD11
AD12
AD18
AD21
AD22
AD28
Module0
Module1
Module2

FIG.11

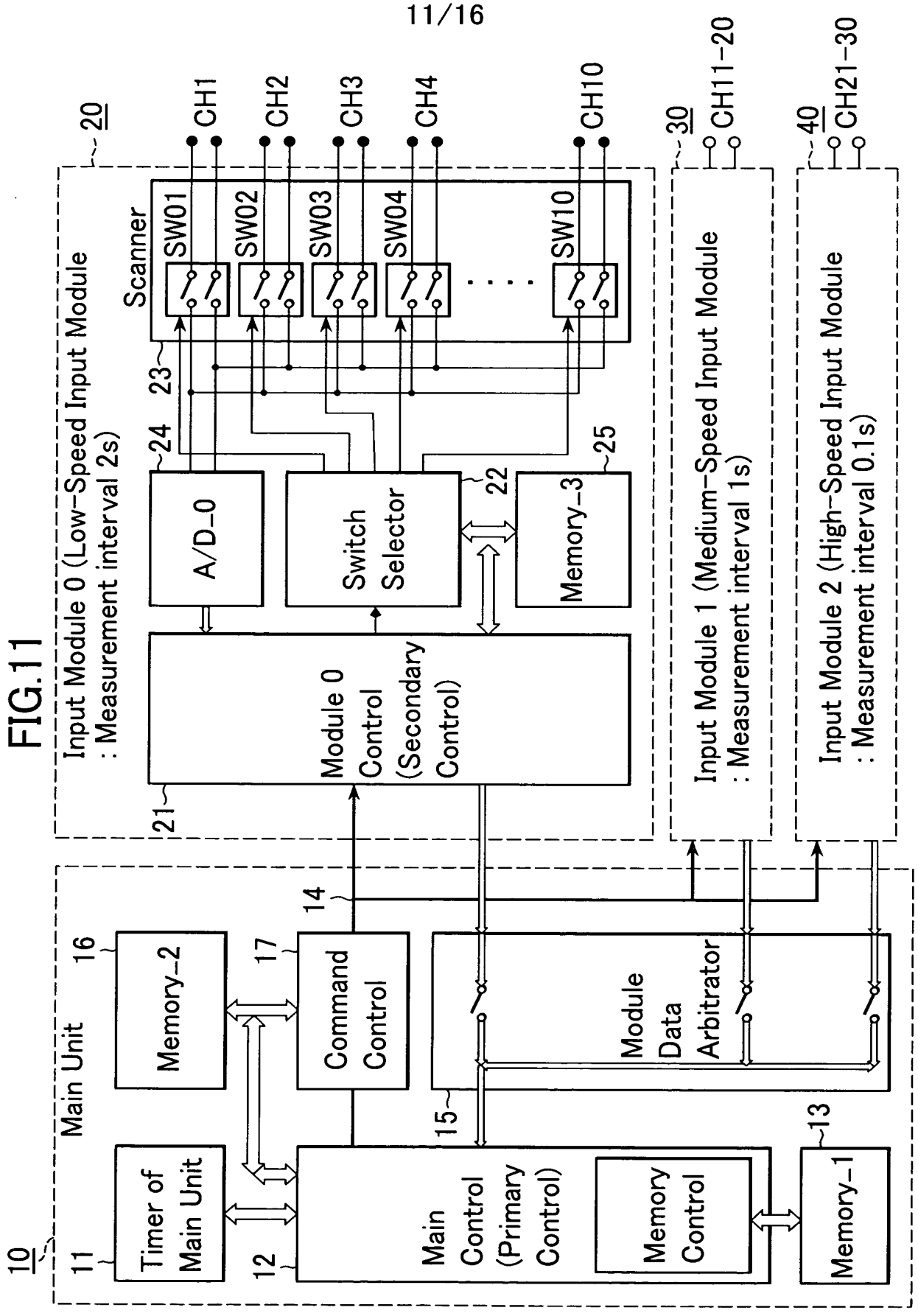

10
Main Unit
11
Timer of Main Unit
12
Main Control (Primary Control)
13
Memory-1
Memory Control
14
15
Module Data Arbitrator
16
Memory-2
17
Command Control
20
Input Module 0 (Low-Speed Input Module : Measurement interval 2s)
21
Module 0 Control (Secondary Control)
22
23
Scanner
SW01
SW02
SW03
SW04
SW10
CH1
CH2
CH3
CH4
CH10
24
A/D-0
25
Switch Selector
Memory-3
30
Input Module 1 (Medium-Speed Input Module : Measurement interval 1s)
CH11-20
40
Input Module 2 (High-Speed Input Module : Measurement interval 0.1s)
CH21-30

FIG.12

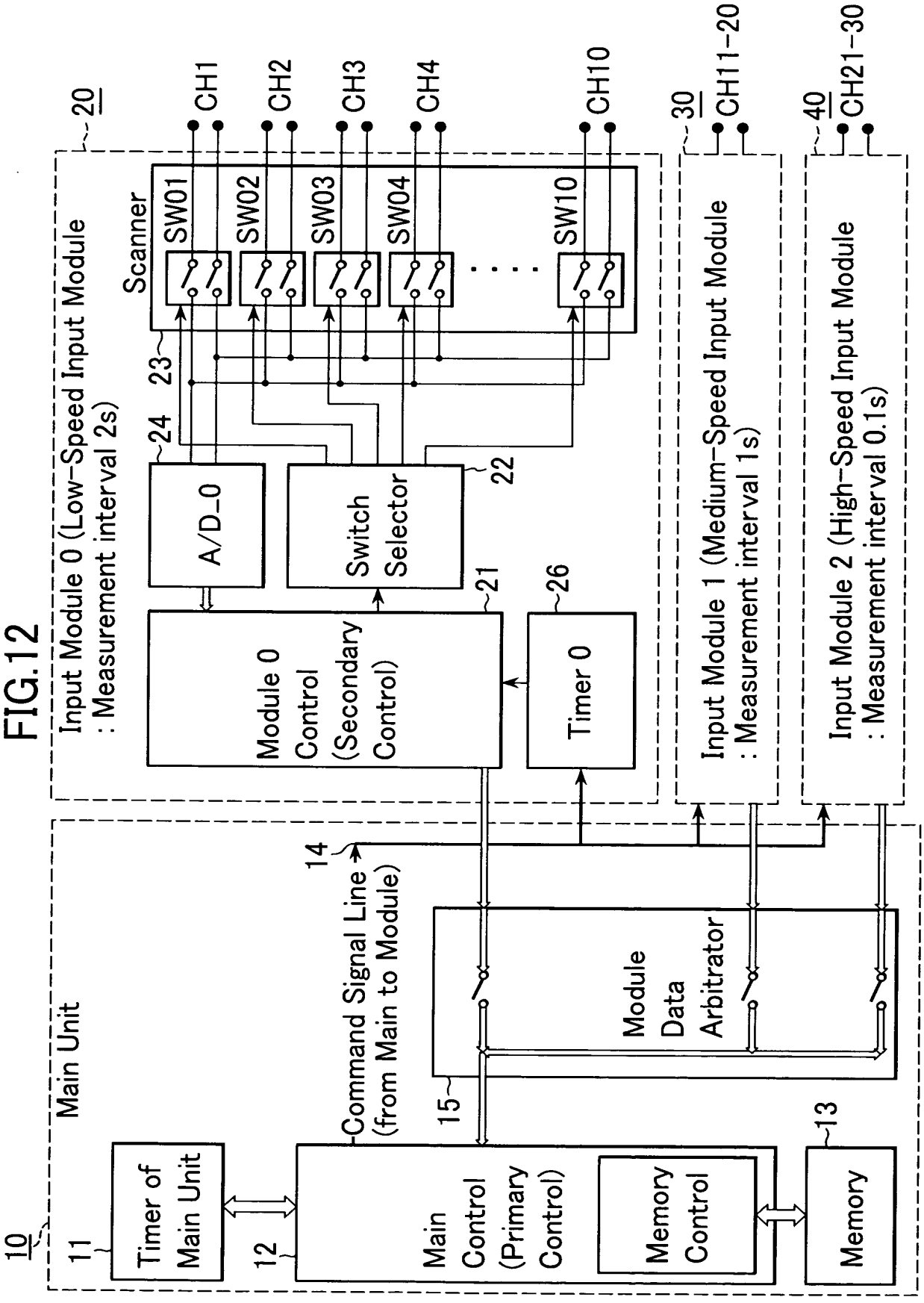

10
Main Unit
11
Timer of Main Unit
12
Main Control (Primary Control)
Memory Control
13
Memory
14
Command Signal Line (from Main to Module)
15
Module Data Arbitrator
20
Input Module 0 (Low-Speed Input Module : Measurement interval 2s)
Scanner
SW01
SW02
SW03
SW04
SW10
CH1
CH2
CH3
CH4
CH10
23
24
A/D_0
Switch Selector
22
21
Module 0 Control (Secondary Control)
26
Timer 0
30
Input Module 1 (Medium-Speed Input Module : Measurement interval 1s)
CH11-20
40
Input Module 2 (High-Speed Input Module : Measurement interval 0.1s)
CH21-30

FIG.13

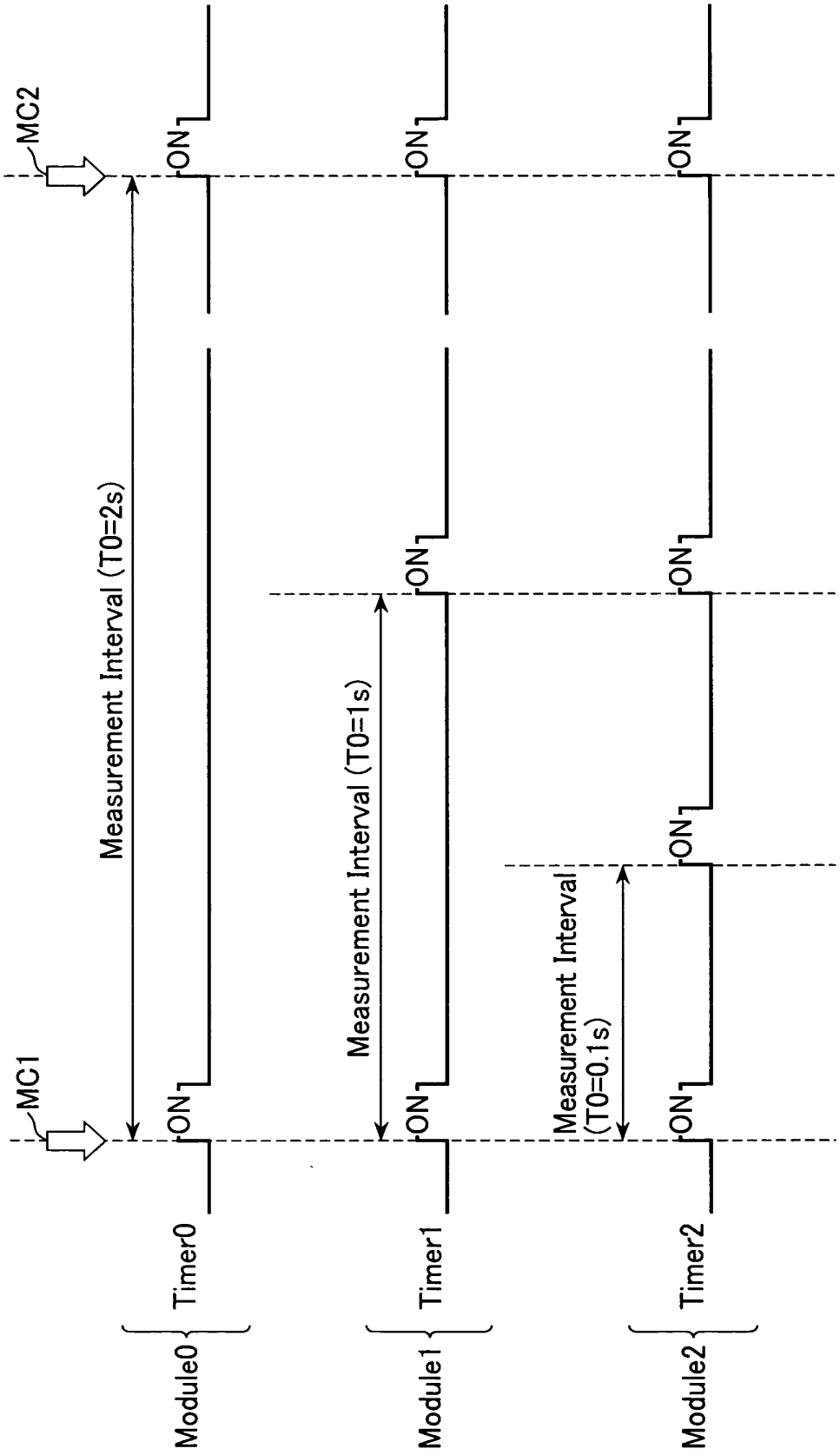

MC2
MC1
ON
Measurement Interval (T0=2s)
Measurement Interval (T0=1s)
Measurement Interval (T0=0.1s)
Timer0
Timer1
Timer2
Module0
Module1
Module2

FIG.14

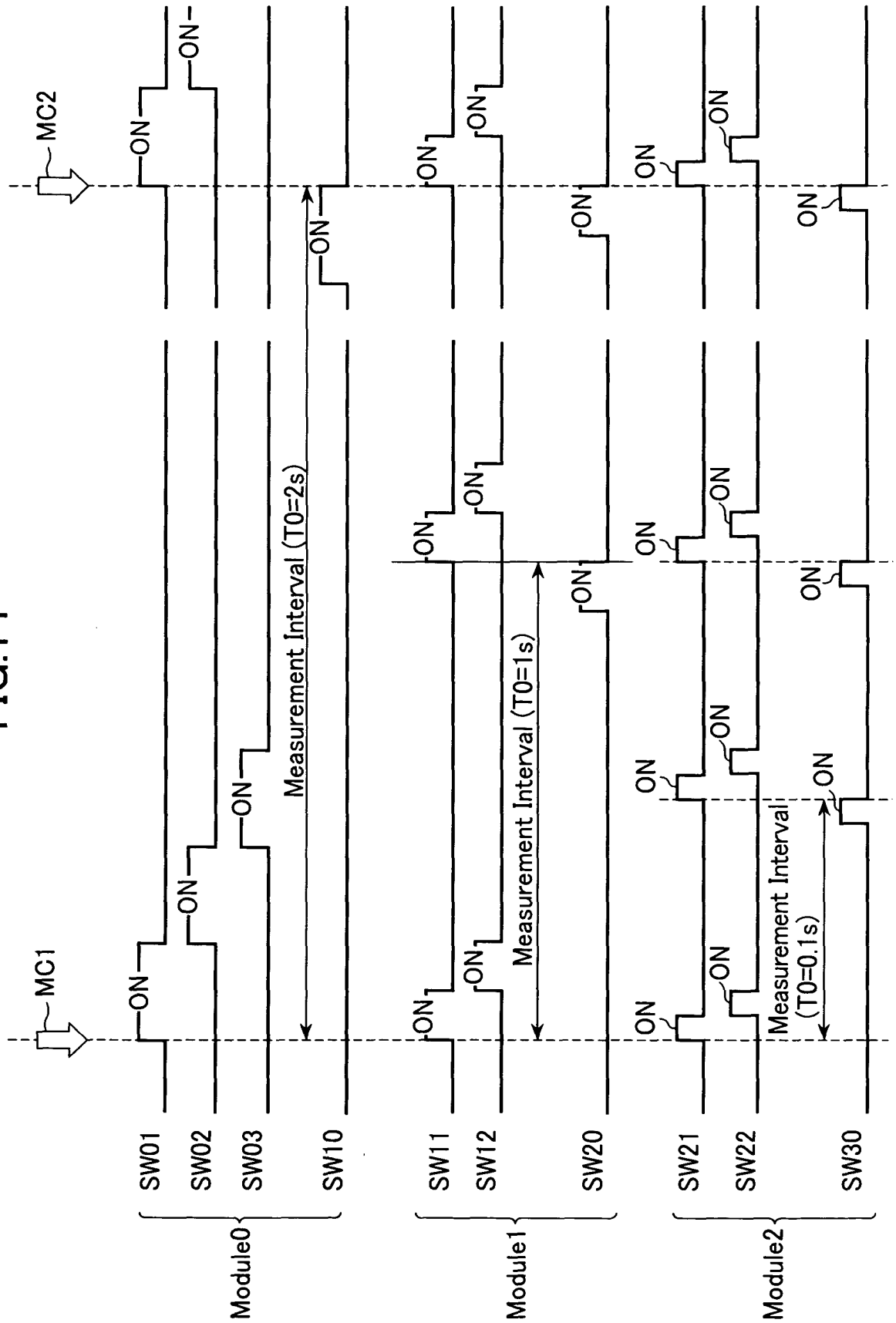

MC1
MC2
ON
Measurement Interval (T0=2s)
Measurement Interval (T0=1s)
Measurement Interval (T0=0.1s)
SW01
SW02
SW03
SW10
SW11
SW12
SW20
SW21
SW22
SW30
Module0
Module1
Module2

FIG.15

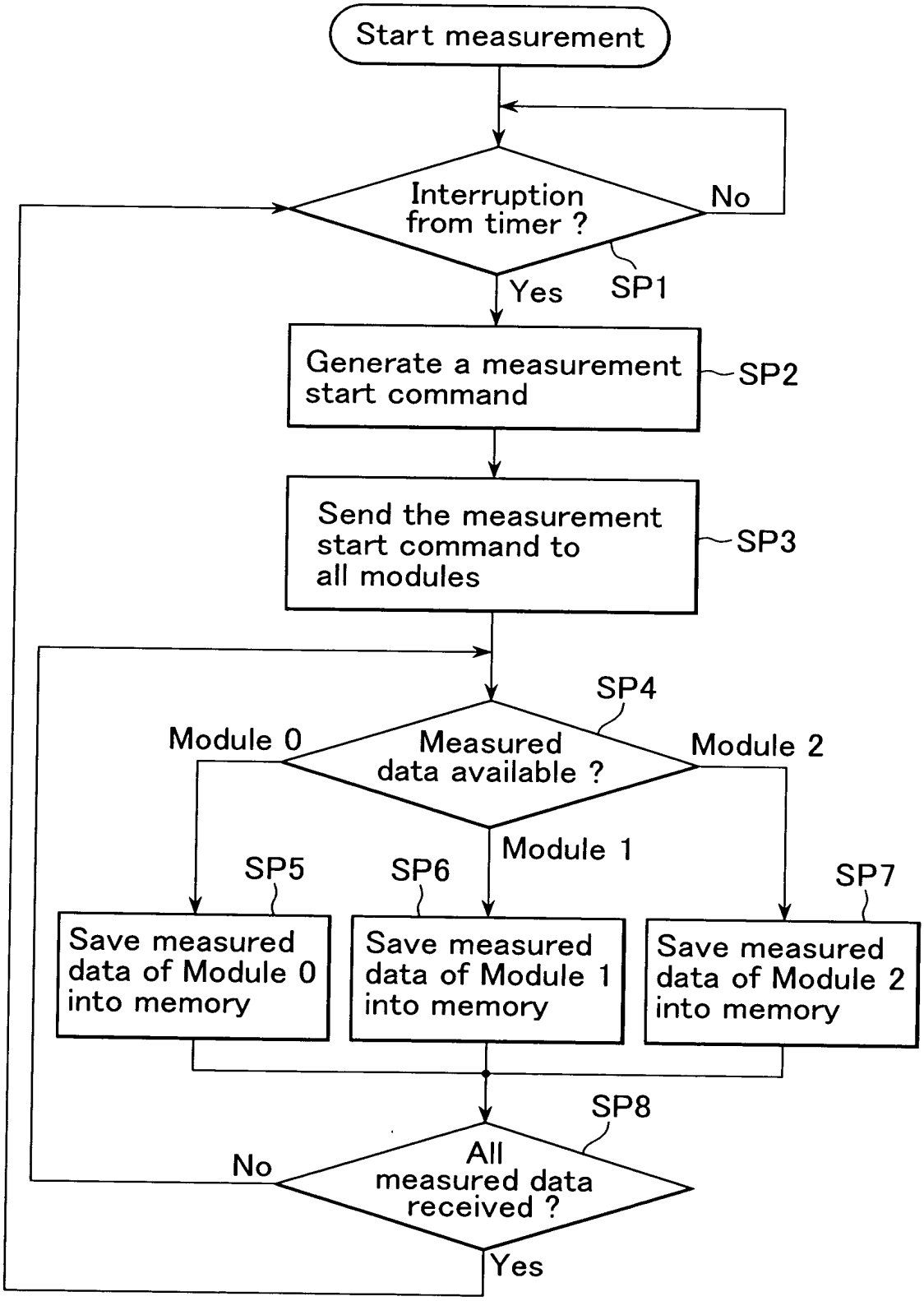
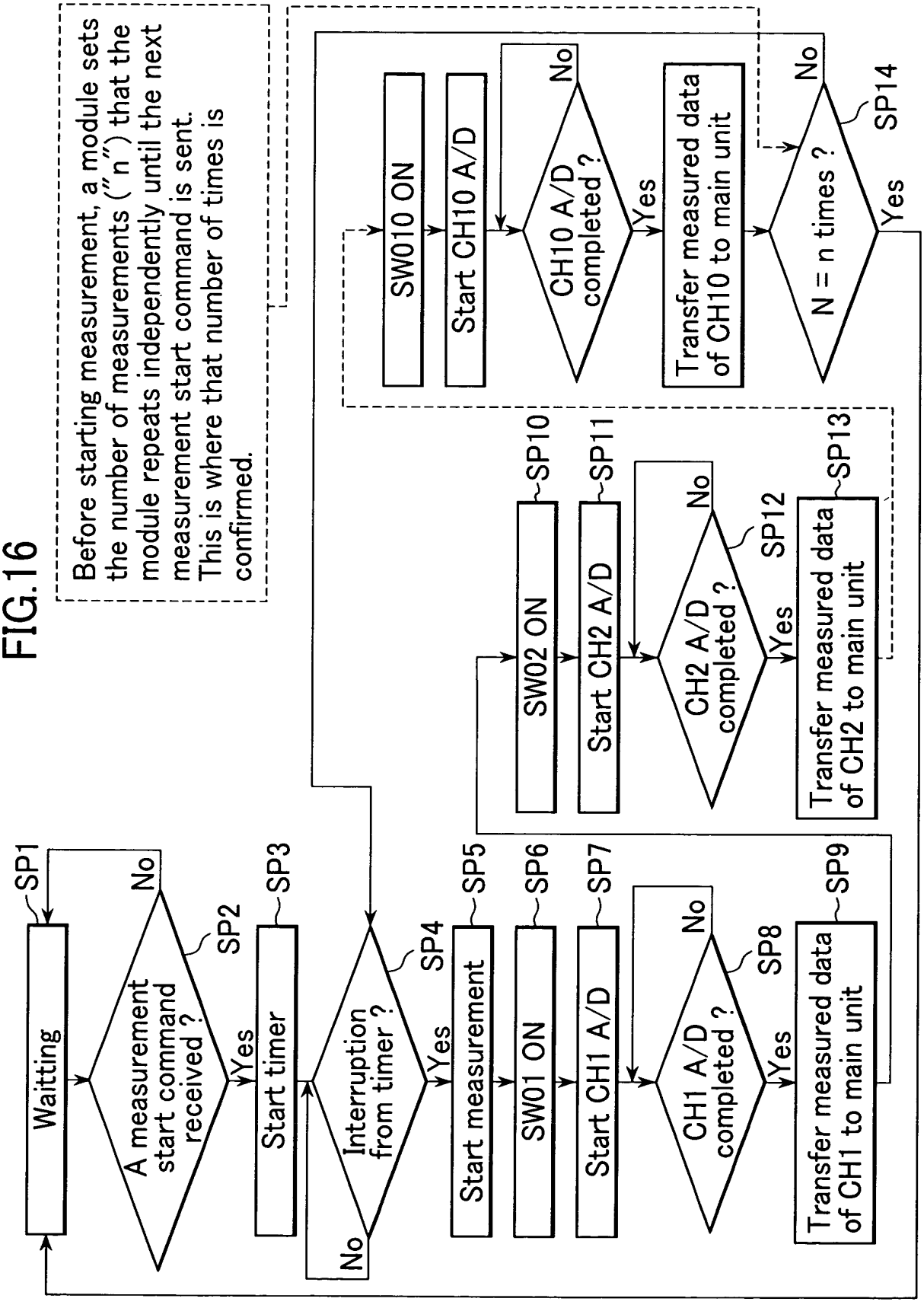

Start measurement
Interruption from timer ?
No
Yes
SP1
Generate a measurement start command
SP2
Send the measurement start command to all modules
SP3
SP4
Module 0
Measured data available ?
Module 2
Module 1
SP5
SP6
SP7
Save measured data of Module 0 into memory
Save measured data of Module 1 into memory
Save measured data of Module 2 into memory
SP8
No
All measured data received ?
Yes

FIG.16


Before starting measurement, a module sets the number of measurements ("n") that the module repeats independently until the next measurement start command is sent. This is where that number of times is confirmed.
SP1
Waitting
SP2
A measurement start command received ?
No
Yes
SP3
Start timer
SP4
Interruption from timer ?
No
Yes
SP5
Start measurement
SP6
SW01 ON
SP7
Start CH1 A/D
SP8
CH1 A/D completed ?
No
Yes
SP9
Transfer measured data of CH1 to main unit
SP10
SW02 ON
SP11
Start CH2 A/D
SP12
CH2 A/D completed ?
No
Yes
SP13
Transfer measured data of CH2 to main unit
SW010 ON
Start CH10 A/D
CH10 A/D completed ?
No
Yes
Transfer measured data of CH10 to main unit
N = n times ?
No
Yes
SP14